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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/622,397	12/01/2000	Hirohisa Kikuyama	FUK-75	6707

22855 7590 10/10/2002

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EXAMINER

CHEN, KIN CHAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 10/10/2002

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/622,397

Applicant(s)

KIKUYAMA ET AL.

Examiner

Kin-Chan Chen

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1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi et al. (US 4,795,582; hereinafter "Ohmi").

Ohmi teaches a surface treatment material for micro processing (so-called micromachining in the claimed invention), see abstract. The material may contain 0.1% by weight of hydrofluoric acid (col. 3, lines 35-36). The material may contain 40% by weight of ammonium fluoride (col. 3, lines 36-37).

The claimed invention differs from Ohmi by specifying less than 0.1% by weight of hydrofluoric acid, and more than 40%, but less than or equal to 47% by weight of ammonium fluoride. However, since the prior art range is close enough that one skilled in the art would have been expected to have the similar properties. Furthermore, concentration and composition are commonly determined by routine experiment. The process of conducting routine optimizations so as to produce an expected result is obvious to one of ordinary skill in the art. Hence, it is the examiner's position that a person having ordinary skill in the art at the time of the claimed invention would have

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found it obvious to modify Ohmi by performing routine experiments by using various concentrations and compositions to obtain optimal result.

Changes in compositions, temperature, concentrations, or other process conditions of a process do not impart patentability unless the recited ranges are critical (i.e., they produce a new and unexpected result that differs in kind and **not merely in degree from the result of the prior art**). *In re Woodruff*, 16USPQ2d 1934,1936 (Fed. Cir.1990); *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809; *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

CRITICALITY OF PROCESSING PARAMETERS

"Where the principal difference between the claimed process and that taught by the reference is a temperature difference, it is incumbent upon applicant to establish criticality of that difference" *Ex parte Khusid*, 174 USPQ 59. This decision is clearly analogous to concentration differences and other process parameters.

As to dependent claim 2, Ohmi teaches the limitation (col. 3, lines 32-35).

As to dependent claims 3 and 9, Ohmi teaches that the material may contain surfactant and in an amount of 10 to 10,000 ppm, which encompasses the claimed range (col. 3, lines 24-26).

As to dependent claim 4, Ohmi teaches the said surfactant, see col. 2, lines 64-65; col. 3, lines 12-14 and lines 18-20.

Response to Arguments

3. Applicant's arguments filed on August 21, 2002 have been fully considered but they are not persuasive.

Applicant has argued that Table 2 (page 13) shows the ammonium fluoride concentration changing from $\leq 40\%$ to $>40\%$ make etching rates of TEOS close to the etching rate of the natural oxidation film, in fact, when the ammonium fluoride concentration is 39.9%, the etching rate difference between TEOS and natural oxidation film is smaller than that with 42% of the ammonium fluoride concentration.

Applicant has argued that Table 3 (page 14) shows the ammonium fluoride concentration changing from $\leq 40\%$ to $>40\%$ make contact hole size of PL-TEOS close to the initial size, in fact, when the ammonium fluoride concentration is 39.9%, the contact hole size of PL-TEOS is same as that with 41% of the ammonium fluoride concentration. Furthermore, the disclosure does not show the criticality of the claimed range by showing the claimed range (less than 0.1% by weight of hydrofluoric acid and more than 40%, but less than or equal to 47% by weight of ammonium fluoride) achieving unexpected results relative to outside the claimed range (e.g., compared with 0.1% by weight of hydrofluoric acid and 40 by weight of ammonium-fluoride).

Conclusion

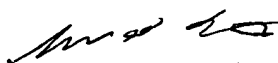
4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.

K-C C
October 9, 2002


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